the week April 14–20 and May 5–11, are the only ones at hand, but will illustrate the slight importance of melted snow as compared with rain.

Up to April 14 the river remained low; the discharge was a little over 100 cubic feet per second. The warm, clear days of Friday, Saturday, and Sunday caused a more rapid melting of snow and an increased volume in the river on Sunday, Monday, and Tuesday. The average for Monday, April 20, was unusually large for this season. The reports indicate that there is little snow left on the mountains below an elevation of 8,000 feet. The amount of snow has been greater than usual, and the total amount of water received (namely at the gauging station) will be greater than for a number of years. Nevertheless there will be the usual scarcity late in the season.

From the bulletin for May 5–11, we quote:

The week having proved a warm one with the temperature of 70° and above, each day at the Agricultural College, and 55°, or over, at elevations of 9,000 feet, the melting of the low-lying snow has proceeded rapidly and the river has exceeded the flow for the corresponding week even in the exceptional year of 1885. The self-recording instruments show that the high water due to the melting of snow at midday on the mountains now reaches the gauging station in the canyon about 5 a. m. of the subsequent day.

The following averages are copied from these bulletins:

Discharge in cubic feet per second of the Poudre River.

Date.	1897.		Average for 1896.	Average, 10 years.
	Daily average.	Daily maximum.		
Wednesday, April 14	128	138	93	145
Thursday, April 15	158	184	124	155
Friday, April 16	173	180	140	160
Saturday, April 17	214	233	145	169
Sunday, April 18	247	364	120	208
Monday, April 19	470	571	109	220
Tuesday, April 20	450	480	114	239
Average for week	270	....	120	185
Wednesday, May 5	1,163	1,240	522	612
Thursday, May 6	1,251	1,321	708	686
Friday, May 7	1,437	1,502	946	748
Saturday, May 8	1,486	1,579	1,125	821
Sunday, May 9	1,472	1,602	....	916
Monday, May 10	1,439	1,546	....	1,000
Tuesday, May 11	1,458	1,568	....	930
Average for week	1,385	....	....	816

Averages for the corresponding weeks in previous years.

Year.	April 14–20.	May 5–11.	Year.	April 14–20.	May 5–11.
1884	146	911	1891	109	143
1885	204	1,358	1892	....	....
1886	....	773	1893	....	....
1887	294	....	1894	....	977
1888	136	354	1895	344	962
1889	93	283	1896	121	*825
1890	157	722	1897	270	1,385

* From the average for 14 days.

SNOWFALL IN COLORADO.

In connection with the preceding subject the most accurate estimates of the amount of snowfall become important. Mr. F. H. Brandenburg of the Weather Bureau, section director for Colorado, on March 10, issued a special snowfall report for that State. In addition to the data furnished by ninety voluntary observers he has received special snowfall returns from about two hundred and fifty special correspondents. According to these over the upper drainage basin of the Arkansas, in general, the snowfall has been greater than last year, and in many cases greater than for many years and large quantities of snow water will be held in reserve. Over the South Platte drainage area much more snow than usual, and the heavy snow slides in the timber will cause it to remain longer than usual. On the Continental Divide, over Clear Creek and Gilpin counties, the fall has been less than the average. Over the upper Rio Grande Basin snowfall was comparatively light, but lower down there was a marked excess. Over the Gunnison River watershed snowfall has been deficient. On the average for the whole eastern slope of Colorado the available water supply will be above the normal.

EVAPORATION AT FORT COLLINS, COLO.

In the Annual Reports of the experiment station at Fort Collins for 1889, 1890, and 1891 (which is the last at hand) details are given as to the measurements and experiments made in order to determine the amount of evaporation, in open air tanks, as well as in the running water of canals. The evaporation from tanks in the sunshine must depend upon the wind at the surface of the water, on the temperature of the water surface, and on the dryness of the air that blows over it; in place of exact measurements of these data approximate values had to be used. The report of Professor Carpenter states that the evaporation expressed in inches of depth of water in twenty-four hours may be computed by the following formula:

$$E = 0.39 \ (P - p) \ (1 + 0.02 \ W)$$

where P is the vapor tension corresponding to the temperature of the surface of the water; p is the vapor tension actually observed in the free air; w is the movement of the wind in miles, in twenty-four hours, at the surface of the water. In computing daily and monthly averages the mean temperature of the water surface is assumed to be the mean between the observations made at 7 a. m. and 7 p. m. The wind was measured by means of the anemometer on a tower a hundred feet distant. The moisture present in the air was deduced from dry and wet bulb thermometers. The coefficients 0.39 and 0.02 give a computed evaporation that is generally within 10 per cent, and on the average of the year is within 2 per cent of the measured evaporation. During 1890 the average daily evaporation from a 3-foot tank sunk in the ground was 0.15 inch. During 1891 the daily evaporation ranged between 0.18 in July and 0.02 in December.

HAIL AND A RAIN GAUGE FOR ITS MEASUREMENT.

The voluntary observer at Beaver in Oklahoma is quoted in the April report of the Oklahoma section as follows:

On the 27th heavy hailstorm came directly from the west, rain lasted twenty minutes, and fully an inch of hail fell; the ground appeared covered with snow. Hail drifted in places to 6 inches deep; 0.70 inch of rain was in the gauge, but no hail, and I estimated the melted hail at 0.30. Hail certainly all bounded out of the gauge as examination was made immediately after the rain ceased.

The difficulty of securing an accurate record of rainfall has led to several improvements in the construction of the rain gauge, the most important of which was the shielded gauge described by Prof. Joseph Henry as early as 1853, and the other form of shielded gauge devised by Professor Nipher in 1878. These shields are intended to protect the gauge from the loss of rainfall by the action of the wind at the mouth of the gauge. Very nearly the same protection against the wind results from the use of the protected gauge introduced by Boernstein and favorably reported upon by Wild and Herrmann.

Another source of error is due to the spattering of raindrops that are broken up into small rebounding particles by striking the ground. The spattering slightly increases the catch of the gauge, whereas the wind effect diminishes the catch to a very appreciable and sometimes a very large extent. A third source of trouble is that brought to mind by the above quotation from the Oklahoma report. Not only do the elastic hailstones bound out of the gauge, but large drops of water may easily do the same if the gauge is improperly constructed; if the drops do not bound outward as a whole, they may still break up and be partly lost as outward spatter. The remedy for this must consist in setting